

4.2.5.4 Water Resources

Impacts associated with the long-term storage options at ORR would affect water resources. The proposed upgrade storage facilities are located outside any 100-year and 500-year floodplain boundaries. No 100- or 500-year floodplain assessments have been conducted at the area proposed for the Collocation Alternative. This could be developed during the siting process. At ORR, surface water resources, primarily the Clinch River, would be used to meet all construction and operation water requirements. The Clinch River has sufficient flow to support any of the alternatives. No construction- or operation-related water withdrawal would exceed 1 percent of the Clinch River's average flow. During construction and operation of the facilities, treated wastewater would be discharged in compliance with permit requirements to nearby streams. Stormwater runoff would be collected, and treated, if necessary, before discharge to natural drainage channels in accordance with permit requirements. [Text deleted.]

Minimal impacts to groundwater are anticipated because no groundwater would be withdrawn and no direct discharges would occur during construction or operation. Table 4.2.5.4-1 presents No Action water resources uses and discharges and the potential changes to water resources at ORR resulting from the long-term storage alternatives.

No Action Alternative

Surface Water. [Text deleted.] A description of the activities that would continue at ORR is provided in Section 3.6. Under this alternative, because of increased operating requirements of existing facilities at ORR, surface water withdrawals from the Clinch River are expected to increase from the current usage of 14,210 million l/yr (3,750 million gal/yr) to 14,760 million l/yr (3,900 million gal/yr), or 0.35 percent of the river's average flow (132 m³/s [4,647 ft³/s]) by the year 2005. Wastewater discharges from Y-12 would continue to East Fork Poplar Creek and Bear Creek, although the volume is expected to increase. As discussed in Section 3.6.4, DOE is currently involved with remediation of East Fork Creek under CERCLA. Under this alternative, current restoration programs would continue.

Groundwater. Under this alternative, no additional impacts to groundwater resources are anticipated beyond those of existing and future activities, which are independent of and unaffected by the proposed action. Currently, one well supplies a small amount of water for a laboratory. Groundwater use is expected to remain constant in 2005.

Water quality data obtained from wells located near the Y-12 facility indicate that water quality has improved near site operations. Under this alternative, current restoration programs would continue. Process and wastewater would continue to be treated at either the Y-12 centralized pollution control facility or at the Y-12 west end treatment facility before being discharged to surface waters. Minimal impacts on groundwater quality are expected due to wastewater releases.

Upgrade Alternative

Preferred Alternative: Modify Existing Y-12 Plant for Continued Highly Enriched Uranium Storage

Surface Water. Water required for construction and operation of the upgraded HEU storage facilities would be provided via existing distribution systems. The source of this water is the Clinch River and its tributaries. [Text deleted.]

During construction, the quantity of water required would be approximately 3.0 million l/yr (0.79 million gal/yr), which would represent a much less than 1-percent increase over the projected No Action surface water withdrawal. This additional withdrawal would cause minimal impacts. During operation, water requirements would be approximately 0.24 million l/yr (0.063 million gal/yr). Supplying this quantity of water would have minimal impacts.

During construction of the upgraded HEU storage facilities, sanitary wastewater (approximately 3.0 million l/yr [0.8 million gal/yr]) would be generated and discharged to the existing Oak Ridge wastewater treatment facility. This would represent a much less than 1-percent increase in the effluent from this facility. During operation, additional sanitary wastewater (0.001 million l/yr [264 gal/yr]) would be discharged to this wastewater treatment system. This would represent a negligible increase in the effluent from this facility. Stormwater runoff would be collected and treated, if necessary, before discharge to natural drainage channels. These additional quantities are insignificant. All discharges would be monitored to comply with permit limits and other discharge requirements.

As discussed in Section 3.6.4, DOE is currently involved with remediation of East Fork Poplar Creek under CERCLA. Any discharges that may influence and potentially impact East Fork Poplar Creek would require engineering design measures to avoid interference with the goals of the remediation effort. All potential HEU storage locations are outside both the 100- and 500-year floodplains.

Groundwater. No groundwater would be used for any project-related water requirements, and no wastewater would be discharged directly to groundwater. Therefore, neither groundwater quality nor availability would be affected. In addition, because there would be no direct discharges to the environment, limestone deposits located beneath the plant would not be a factor for future contamination.

Collocation Alternative

Construct New Plutonium Storage Facility; Maintain Existing Highly Enriched Uranium Storage Facilities at Y-12 Plant

Surface Water. During construction of the facilities, approximately 85 million l/yr (22.5 million gal/yr) would be supplied from the Clinch River. This amount equates to approximately a 0.6-percent increase in annual water use and much less than 1 percent of the Clinch River flow. During operation, water requirements would be 280 million l/yr (74 million gal/yr), representing a 1.9-percent increase in projected water use and much less than 1 percent of the Clinch River flow. Supplying this amount would cause minimal impacts.

During construction, approximately 7.8 million l/yr (2.1 million gal/yr) of sanitary wastewater would be generated, treated, and discharged to the existing Oak Ridge wastewater treatment facility. This would represent a 0.3-percent increase in the effluent from this facility. During operation, additional sanitary wastewater (137 million l/yr [36.2 million gal/yr]) would be discharged to this wastewater treatment system. All discharges would be monitored to comply with discharge requirements.

No 100- or 500-year floodplain assessments have been conducted for the new collocated facilities. This would be developed during the siting process.

Groundwater. No groundwater would be used for any project-related water requirements and no wastewater would be discharged directly to groundwater. Therefore, neither groundwater quality nor availability would be affected. In addition, because there would be no direct discharges to groundwater, limestone deposits located beneath the plant would not be a factor for future groundwater contamination transportation.

Construct New Plutonium Storage Facility and Modify Existing Highly Enriched Uranium Storage Facilities at Y-12 Plant

Surface Water. The water requirements during construction and operation of the new consolidated Pu storage facility and upgraded Y-12 are slightly higher than those discussed for the Pu storage facility only. The water requirements are approximately 88 million l/yr (23.2 million gal/yr) during construction and 280.2 million l/yr (74 million gal/yr) during operation, which would represent about a 0.6- and 1.9-percent increase, respectively, over the projected No Action surface water withdrawal. These amounts each represent much less than 1 percent of the Clinch River flow and would cause minimal impacts to river levels.

During construction of the facilities, sanitary wastewater (10.8 million l/yr [2.3 million gal/yr]) would be generated and discharged to the treatment facility. During operations, additional sanitary wastewater (137 million l/yr [36.2 million gal/yr]) would be treated, and the effluent discharged. All discharges would be routinely monitored to comply with NPDES permit limits and other site-specific discharge requirements. All potential locations are located outside both the 100- and 500-year floodplains.

No 100- or 500-year floodplain assessments have been conducted for the new collocated facilities. This would be developed during the siting process.

Groundwater. No groundwater would be used for any project-related water requirements, and no wastewater would be discharged directly to groundwater. Therefore, neither groundwater quality nor availability would be affected. In addition, because there would be no direct discharges to the environment, limestone deposits located beneath the plant would not be a factor for future groundwater contamination.

Construct New Plutonium and Highly Enriched Uranium Storage Facilities

[Text deleted.]

The impacts associated with the new Pu and HEU storage facilities are the same as those discussed above, with the following exceptions. The water requirements for construction and operation of this option are greater than those described for the new consolidated Pu storage facility and upgrade of Y-12 Plant and are approximately 104.7 million l/yr (27.7 million gal/yr) and 360 million l/yr (95.1 million gal/yr), respectively. These additional requirements represent 0.7- and 2.4-percent increases, respectively, in the projected annual surface water withdrawals from the Clinch River. These increases, however, represent much less than 1 percent of the average flow of the Clinch River and would cause minimal impacts.

Sanitary wastewater quantities generated during construction and operation of this option are approximately 13.0 million l/yr (3.4 million gal/yr) and 172 million l/yr (45.4 million gal/yr), respectively. These additional effluents represent 0.6- and 7.6-percent increases, respectively, in discharge and 0.03- and 0.4-percent, respectively, of the average flow of East Fork Poplar Creek. No impacts are expected.

As discussed in Section 3.6.4, DOE is currently involved with remediation of East Fork Poplar Creek under CERCLA. Any discharges that may influence and potentially impact East Fork Poplar Creek would require engineering design measures to avoid interference with the goals of the remediation effort. Since groundwater would not be used for this option, no impacts to groundwater availability or quality would be expected.

Subalternative Not Including Strategic Reserve and Weapons Research and Development Materials

Water resource impacts during construction and operation for this subalternative are expected to be slightly less than those for the No Action Alternative, the Upgrade Alternative, and the Collocation Alternative because of the reduction in the amount of material. [Text deleted.]

Phaseout

If the current HEU storage mission at ORR was phased out, surface water withdrawals from the Clinch River and nonhazardous wastewater discharge to the Clinch River would decrease by negligible quantities (0.29 million l/yr [0.077 million gal/yr]). No noticeable impacts would occur or be alleviated due to these decreases.

[Text deleted.]